

A NEW *ASHMUNELLA* (POLYGYRIDAE) FROM DOÑA ANA COUNTY, NEW MEXICO

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Reported here is a new species of snail of the genus *Ashmunella* from Mount Riley, Doña Ana County, in south-central New Mexico. Mount Riley is located approximately 30 miles west of El Paso, Texas, and 33 miles southwest of Las Cruces, New Mexico. "Mount" Riley actually consists of two mountains (herein called Northeast Mt. Riley and Southwest Mt. Riley in reference to their relative positions) located mainly in the southwest part of T. 27 S, R. 2 W. Northeast Mt. Riley (mainly in Secs. 29 and 30) com-

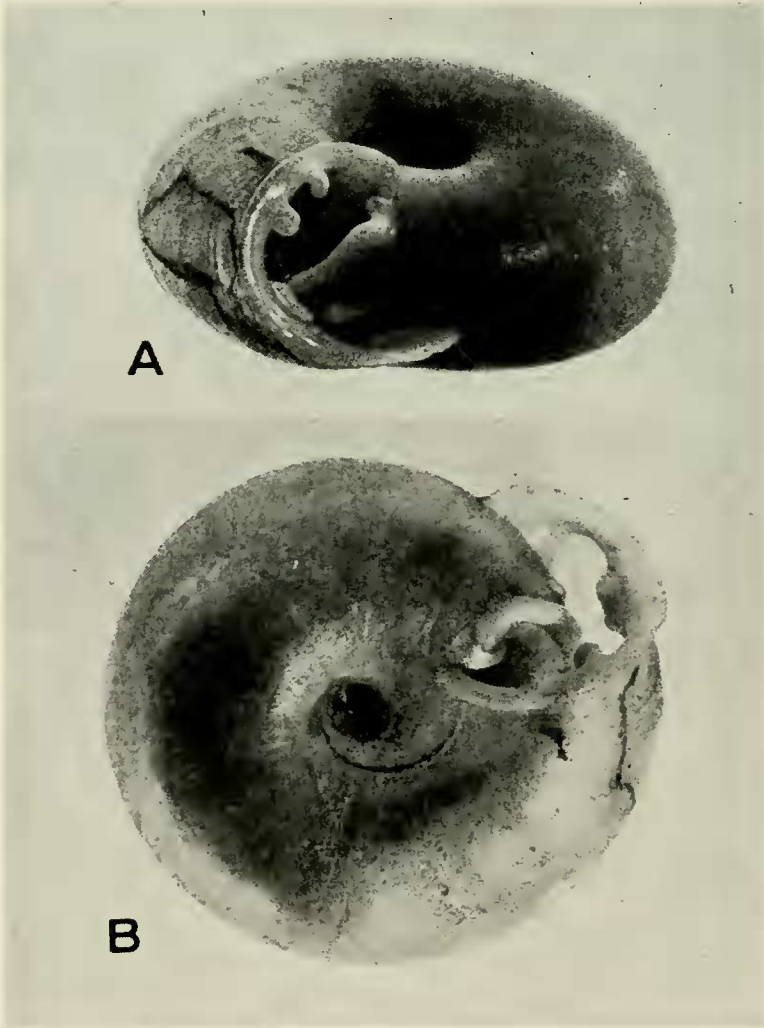


Fig. 1. Holotype of *Ashmunella rileyensis* new species, Mount Riley, Doña Ana Co., New Mexico (ANSP 319120).

prises a major peak (5915 ft.) in its southern part and, north of a low (5160 ft.) saddle, a series of four peaks ascending stairstep-wise to the highest, northwesternmost peak (5803 ft.). A valley *ca.* one-half mile wide separates Northeast Mt. Riley from Southwest Mt. Riley (mainly in Sec. 31), which is smaller, more conical in shape, and with only one major peak (5957 ft.), which is centrally located.

The only trees in the mountains are scattered one-seeded junipers (*Juniperus monosperma*). Salient larger plants include broad-leaved yuccas (*Yucca baccata* and *Y. torreyi*), sotol (*Dasylyrion wheeleri*), several kinds of cacti, ocotillo (*Fouquieria splendens*), sumacs (*Rhus microphylla* and *R. trilobata*), and saltbush (*Atriplex canescens*).

In general, the same kind of rock is found throughout the mountains. The rock is igneous and fine-grained, possibly a dacite (Dr. Jerry M. Hoffer, pers. comm.). Dane and Bachman (1961) mapped Mt. Riley as consisting of extrusive rock of Tertiary age. The rock produces large amounts of talus, which has accumulated on slopes, especially at the heads of ravines in the mountains. All *Ashmunella* (except fossils) were taken by digging in this talus. A slope-wash mantle, probably of late Pleistocene age, has accumulated on the lower parts of some steep slopes. This sediment yielded a few fossil *Ashmunella* at Locality 5 (see below).

The new species was taken at the following localities shown on the Mt. Riley 15 minute topographic map, edition of 1929. All are in T. 27 S, R. 2W.

1. Northeast Mt. Riley. SW $\frac{1}{4}$,SW $\frac{1}{4}$,SW $\frac{1}{4}$, Sec. 28. From talus on east slope of mountain. 5200-5300 ft.

2. Type locality. Northeast Mt. Riley. SW $\frac{1}{4}$,NE $\frac{1}{4}$, Sec. 30. From talus at head of southwest-draining ravine between 5803 ft. peak and next peak (5260 ft.) to the northwest; 3 mm NE of "0" in "30" on topo. map. *ca.* 5200 ft.

3. Southwest Mt. Riley. NE $\frac{1}{4}$,SE $\frac{1}{4}$,NW $\frac{1}{4}$, Sec. 31. From prominent talus accumulation on steep north slope of mountain to south of intermontane valley. 5100-5200 ft.

4. Southwest Mt. Riley. SW $\frac{1}{4}$,NE $\frac{1}{4}$,SW $\frac{1}{4}$, Sec. 31. From talus at head of west-draining ravine on west side of highest peak. *ca.* 5200 ft.

5. Southwest Mt. Riley. NE $\frac{1}{4}$,NE $\frac{1}{4}$,NW $\frac{1}{4}$, Sec. 31. Reddish slope mantle exposed in arroyo bank towards lower part of steep

north-facing slope. Probably of late Pleistocene age. 4800-4900 ft.

Other localities mentioned herein from which comparative material of other species of *Ashmunella* were obtained are:

6. *A. kochi* Clapp. New Mexico, Doña Ana Co., NW $\frac{1}{4}$, Sec. 9, T. 19 S, R. 4 E. West slope of San Andres Mts., ca. .8 mil. ESE Ropes Spring. 6900 ft.

7. *A. kochi*. New Mexico, Doña Ana Co., NW $\frac{1}{4}$, SW $\frac{1}{4}$, Sec. 5, T. 23 S, R. 4 E. Organ Mts., Fillmore Canyon at "The Narrows." 7050 ft.

8. *A. organensis* Pilsbry. New Mexico, Doña Ana Co., NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 5, T. 23 S, R. 4 E. Organ Mts.; environs of Rock House Spring. 7850 ft.

9. *A. pasonis* (Drake). Texas, El Paso Co. 31°58'1" N Lat; 106°30'45" W Long. West side of Franklin Mts. at mouth of Vinton Canyon, the type locality of the species. 4900 ft.

Specimens have been deposited in the following museums: Academy of Natural Sciences of Philadelphia (Type, 319120; Paratypes, 319121 and 319122); United States National Museum (Paratypes, 681637); University of Michigan Museum of Zoology (Paratypes, 231087); Department of Biological Science, University of Arizona (Paratypes, 4366); Delaware Museum of Natural History, Paratypes (40844 and 40845).

Ashmunella rileyensis new species

(Fig. 1, A-B)

Shell. Shell depressed and slightly angular around the upper periphery of body whorl; relatively narrowly umbilicate (for the genus), the umbilicus contained 4-6 times in the diameter; embryonic whorl smooth, succeeding whorls finely marked with delicate growth lines; second and third whorls sparingly and minutely papillose; fine spiral striae on base of body whorl (papillae and striae not observable except with considerable magnification); periostracum glossy, light tan in color except for inner surface of lip and teeth, which are white; aperture obliquely oriented; parietal callus exceedingly thin, same color as body whorl and scarcely discernable from it; two parietal teeth, the basal tooth longer, oblique, slightly sinuous, widest and highest anteriorly; dorsal parietal tooth shorter, lower, rising symmetrically to highest point, located centrally; three marginal teeth in outer lip, upper tooth rectangular, the two lower teeth longitudinally compressed, the upper one slightly longer.

Table 1. Proportions involving some characters of shells and genitalia of several species of Ashmunella. Locality numbers in parentheses are identified in text. Measurements taken as indicated in section "Measurements of Holotype." S.D.=standard deviation; N=number of specimens; l.=length; w.=width; dia.=diameter.

Character, Species, Locality	Range	Mean	S.D.	N
Shell dia./l. lower parietal tooth:				
<u>A. organensis</u> (8)	8.33-12.15	9.97	1.01	20
<u>A. rileyensis</u> (5)	8.79-8.87	8.83		2
<u>A. rileyensis</u> (4)	5.92-7.14	6.62	.33	10
<u>A. rileyensis</u> (2)	4.42-6.40	5.27	.23	44
<u>A. kochi</u> (7)	5.70-7.50	6.62	.44	25
<u>A. kochi</u> (6)	5.73-8.18	6.97	.33	16
Shell dia./w. of umbilicus:				
<u>A. organensis</u> (8)	5.54-7.55	6.66	.51	20
<u>A. rileyensis</u> (5)	5.38-6.76	6.02		4
<u>A. rileyensis</u> (2)	3.90-6.04	5.03	.52	44
<u>A. kochi</u> (7)	3.33-4.77	4.18	.34	25
<u>A. kochi</u> (6)	3.00-3.90	3.37	.20	16
Shell dia./w. of reflected lip:				
<u>A. rileyensis</u> (2)	13.55-20.43	16.75	1.77	44
<u>A. kochi</u> (7)	12.10-18.86	14.72	1.90	25
<u>A. kochi</u> (6)	12.29-15.45	13.73	.82	16
Penis l./free oviduct l.:				
<u>A. rileyensis</u> (2)	1.89-2.47	2.08		7
<u>A. kochi</u> (7)	1.52-1.80	1.66		2
<u>A. kochi</u> (6)	1.20-1.45	1.34		3
<u>A. pasonis</u> (9)	1.00-1.30	1.07		6

Measurements of Holotype. Whorls 5½; maximum diameter 14.7 mm; height 5.7 mm; umbilicus (measured as in Clench and Miller, 1966:3) 3.0 mm; length of upper and lower parietal teeth 1.5 and 3.0 mm; length of upper tooth of outer lip 1.8 mm; apertural height (between two ends of outer lip) 4.6 mm; greatest diameter of reflected lip (measured from surface behind aperture)

Table 2. Measurements (mm) of diameter and height of shell and several parts of the genitalia of seven paratypes (topotypes from Loc. 2) of *Ashmunella rileyensis*.

Shell diameter	15.0	14.0	14.6	14.2	16.4	13.8	14.1
Shell height	5.7	5.0	5.7	5.4	6.2	5.3	5.2
Atrium	1.7	—	1.7	2.0	2.1	1.5	—
Vagina	3.5	4.2	4.5	4.2	4.0	3.6	3.3
Free oviduct	2.8	2.5	2.9	2.7	2.2	2.1	1.7
Spermatheca and duct	41.5	36.0	36.5	38.1	39.7	38.0	23.0
Penis	5.3	4.9	5.6	5.2	4.5	4.9	4.2
Epiphallus	35.5	38.0	35.4	36.3	32.5	34.5	24.4
Flagellum	.9	.8	.8	.8	1.0	.7	1.0

.9 mm. Slight cracks, seemingly resulting from an injury to the shell that later healed, occur on part of the body whorl of the holotype and are discernable in Fig. 1, A-B.

Variation in Characters of Shell. Parietal dentition is less well developed in specimens from Southwest Mt. Riley (Locs. 3, 4) and in the fossils from Loc. 5 than in specimens from Northeast Mt. Riley (Locs. 1, 2). In the former specimens, the upper parietal tooth is absent or consists only of a minute swelling. The lower parietal tooth is shorter in populations from Southwest Mt. Riley and in fossil specimens (Table 1). The teeth of the outer lip are similar in size in northeastern and southwestern living populations but are extremely low in the fossils. The space between the two lower teeth of the outer lip is greater in southwestern and in fossil specimens. The umbilicus is narrower in the fossil than in the living specimens (Table 1).

Color. Sole whitish, light gray ventrolaterally and in entire caudal region, grading to dark gray on dorsal surface anteriorly; tentacles dark gray.

Genitalia. (Fig. 2). The upper sac of the penis is approximately half as wide as the lower sac. The upper sac of the penis comprises an upper, wider and a lower, narrower part; the lower part, thus, produces a prominent constriction in the penis (Fig. 2). The greater width of the upper part of the upper sac is produced by the presence of swollen tissue of glandular appearance. This mass

of tissue is somewhat C-shaped, investing *ca.* $\frac{2}{3}$ of the periphery, with the two ends of the "C" greatly incurved, protruding inward to constrict the lumen and give it, in cross-section, the appearance of a trident (see enlarged x-sec. in Fig. 2). The penis is *ca.* 1.1-1.5 times as long as the vagina and 1.9-2.5 times as long as the free oviduct. A short penial retractor muscle originates on the epiphallus and inserts in the lung cavity lining. The area of muscle attachment on the epiphallus is connected to the upper sac of the penis by an enveloping fold of connective tissue. The area of insertion of this tissue varies from high to low on the upper sac. The flagellum is

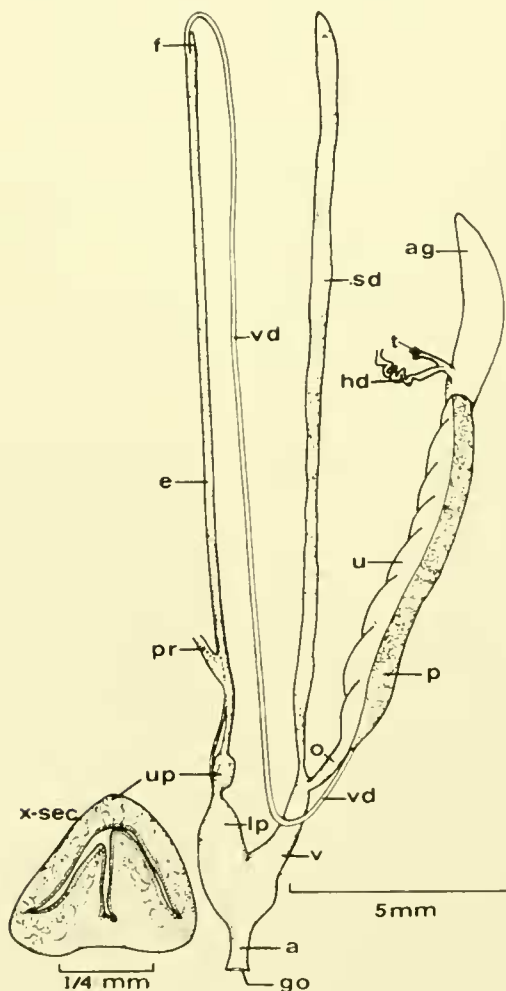


Fig. 2. Genitalia of *Ashmunella rileyensis* new species. Paratype (also topotype, Loc. 2) from Mount Riley, Doña Ana Co., New Mexico. a, atrium; ag, albumen gland; e, epiphallus; f, flagellum; go, genital orifice; hd, hermaphroditic duct; lp, lower sac of penis; o, free oviduct; p, prostate; pr, penial retractor; sd, spermathecal duct; t, talon; u, uterus; up, upper sac of penis; v, vagina; vd, vas deferens.

closely bound to the epiphallus. Both the epiphallus and the spermatheca vary greatly in length, perhaps depending on the presence or absence of a spermatophore as suggested by Webb (1954:17) for *Ashmunella rhyssa* (Dall). The talon consists of a relatively long, slender stalk with a well-defined central canal and small lobes at its end. Measurements of seven specimens are presented in Table 2.

Comparisons and Relationships

A. rileyensis belongs to the group of *Ashmunella* discerned by Pilsbry (1940:913-914) as having the upper part of the penis approximately half as wide at the lower part. His figure (1940:525, 9) of *A. organensis* Pilsbry illustrates well this kind of penis. In addition to *A. organensis*, *A. kochi* Clapp from the San Andres and Organ Mts., New Mexico, and *A. pasonis* (Drake) from the Franklin Mountains, Texas, possess similar penial anatomy. Both *A. organensis* and *A. kochi* occur in the Organ Mts. The latter species was reported as *A. mearnsi* (Dall) by Cockerell (1897:69), was suggested as probably being referable to *A. kochi* by Pilsbry (1915:329), and was listed as *A. kochi* by Metcalf (1969:Table 1). This representative of *A. kochi* may be deserving of subspecific status; it has not been critically studied.

Although of questionable taxonomic significance, the atrium, spermatheca, and epiphallus are also similar in their relative proportions in the species noted above. In regard to shell characters, *A. kochi* from the Organ and San Andres Mts. and *A. rileyensis* have much in common. The flattened shell, oblique aperture, and number and arrangement of teeth are similar. *A. rileyensis* seems to resemble more closely the representative from the Organ Mts. in proportions of the shell and genitalia (Table 1) and both lack the deep-seated lamella behind the lip inside the last whorl found in *A. kochi* from the San Andres Mts. (Pilsbry, 1940:977). However, the umbilicus is significantly narrower in *A. rileyensis* than in *A. kochi* and closer to the extremely narrow umbilicus of *A. organensis* (Table 1). The lip is reflected to a greater degree in *A. kochi* and *A. pasonis* than in *A. rileyensis* (Table 1). *A. rileyensis* possesses a relatively longer penis and a shorter free oviduct than do specimens of *A. kochi* and *A. pasonis* (Table 1).

There seems little doubt that *A. rileyensis* is closely related to the *kochi-organensis-pasonis* complex and is probably closest to *A. kochi*.

However, the few fossil specimens of *A. rileyensis* recovered (Loc. 5) have a narrower umbilicus and more poorly developed dentition than any living specimens found (Table 1). In these characters they approach the condition of *A. organensis* (Table 1). Conceivably, then, *A. rileyensis* has evolved not from a snail like living *A. kochi*, but from some common ancestor (or another, extinct relative) of *A. kochi* and *A. organensis*.

The nearest known species of *Ashmunella* to the west of Mt. Riley are *A. mearnsi* (Dall) and *A. hebardi* Pilsbry and Vanatta of the Big Hatchet Mts. and *A. walkeri* Ferriss of the Florida Mts. In *A. mearnsi* and *A. walkeri*, the upper sac of the penis is wider than in the group of species discussed above; probably, then, *A. mearnsi* and *A. walkeri* are somewhat removed phyletically from that group.

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ON A SINISTRAL CHONDROPOMINE FROM JAMAICA

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While sinistral specimens of normally dextral land pulmonates have been more or less frequently reported, records of such teratological land prosobranchs are very rare, especially in the Pomatiasidae. Dautzenberg (1914, *Bull. Soc. Zool. France*, 39: